

WHAT IS CLAIMED IS:

1. A method of providing wireless data communication at a control entity, said method comprising:

receiving data in accordance with an Open Systems Interconnection (OSI) reference model level 3 protocol;

selecting one of a centralized mode and a distributed mode;

implementing, when said centralized mode is selected, all operations of an OSI reference model layer 2 protocol to deliver said data to at least one transceiver device; and

implementing, when said distributed mode is selected, only a portion of operations of said layer 2 protocol to deliver said data to said at least one transceiver device;

said portion of operations of said layer 2 protocol including at least those of a centralized protocol sub-layer.

2. The method of claim 1 wherein said receiving step includes receiving service data units (SDUs).

3. The method of claim 1 wherein said step of selecting one of said centralized mode and said distributed mode includes selecting according to at least one of a data transmission rate, mobility of a user device and a type of user application.

4. The method of claim 1 wherein said step of implementing when said distributed mode is selected includes delivering said data to a plurality of transceiver devices such that only one of said plurality of transceiver devices transmits said data to a user device.

5. The method of claim 1 wherein said step of implementing when said centralized mode is selected includes delivering said data to at least two transceiver devices such that both of said transceiver devices concurrently transmit said data to a user device.

6. The method of claim 1 wherein said portion of operations of said layer 2 protocol includes those of at least one of a centralized radio link protocol (C-RLP) sub-layer and a centralized medium access control (C-MAC) sub-layer.

7. The method of claim 1 further comprising the step of redelivering at least a portion of said data to said transceiver device.

8. The method of claim 1 further comprising the step of assigning a respective sequence number to each byte of said data prior to delivering said data.

9. A method of providing wireless data communication at a transceiver station, said method comprising:

receiving data from a control entity in accordance with a selected one of a centralized mode and a distributed mode, said receiving step including receiving, in accordance with said centralized mode, said data subsequent to implementation of all of an Open Systems

Interconnection (OSI) reference model layer 2 protocol and receiving, in accordance with said distributed mode, said data subsequent to implementation of a portion of said OSI reference model layer 2 protocol;

implementing, when said distributed mode is selected, a further portion of said layer 2 protocol prior to transmitting said data, said further portion of said layer 2 protocol including at least one distributed protocol sub-layer; and

implementing an OSI reference model physical (PHY) layer protocol to transmit said data to a user device.

10. The method of claim 9 wherein said portion of said layer 2 protocol includes at least one of a centralized radio link protocol (C-RLP) sub-layer and a centralized medium access control (C-MAC) sub-layer.

11. The method of claim 9 wherein said further portion of said layer 2 protocol includes at least one of a distributed radio link protocol (D-RLP) sub-layer and a distributed medium access control (D-MAC) sub-layer.

12. The method of claim 9 wherein said step of implementing an OSI reference model PHY layer includes generating protocol data units (PDUs).

13. The method of claim 9 further comprising the step of generating, prior to transmitting said data, a frame comprising at least a portion of said data, said frame including a header that

includes a sequence number corresponding to a first data byte of said frame and a length of said frame.

14. The method of claim 9 further comprising the step of receiving, from said user device, information that conveys at least one of: received signal-to-interference ratios of a plurality of transceiver devices, an automatic repeat request (ARQ) state, data flow integrity, measured pilot signal strength values of said plurality of transceiver devices, a sequence number of a next data byte to be transmitted to said user device, a sequence number of a last byte that was cleared from a re-sequencing buffer of said user device, and sequence numbers of data bytes that are to be retransmitted.

15. The method of claim 14 wherein said sequence number of said next data byte comprises at least one of: a first data byte of newly transmitted data and a first data byte of previously transmitted data.

16. An apparatus for providing wireless data communication, said apparatus comprising:
a buffer configured to receive data in accordance with an Open Systems Interconnection (OSI) reference model level 3 protocol;

a switch configured to select one of a centralized mode and a distributed mode;

an automatic repeat requestor configured to implement, when said centralized mode is selected, all operations of an OSI reference model layer 2 protocol to deliver said data to at least one transceiver device; and

a multi-caster configured to implement, when said distributed mode is selected, only a portion of operations of said layer 2 protocol to deliver said data to said at least one transceiver device;

said portion of operations of said layer 2 protocol including at that of a centralized protocol sub-layer.

17. The apparatus of claim 16 wherein said multi-caster is further configured to deliver said data to a plurality of transceiver devices such that only one of said plurality of transceiver devices transmits said data to a user device.

18. The apparatus of claim 16 wherein said automatic repeat requestor is further configured to deliver said data to at least two transceiver devices such that both of said transceiver devices concurrently transmit said data to a user device.

19. The apparatus of claim 16 wherein said automatic repeat requestor is further configured to redeliver at least a portion of said data to said transceiver device.

20. An apparatus for providing wireless data communication, said apparatus comprising:
a buffer configured to receive data in accordance with a selected one of a centralized mode and a distributed mode, said buffer being configured to receive said data in accordance with said centralized mode subsequent to implementation of all of an Open Systems Interconnection (OSI)
5 reference model layer 2 protocol, said buffer being configured to receive said data in accordance

with said distributed mode subsequent to implementation of a portion of said OSI reference model layer 2 protocol;

a distributed protocol entity configured to implement, when said distributed mode is selected, a further portion of said layer 2 protocol prior to transmitting said data, said further
5 portion of said layer 2 protocol including at least one distributed protocol sub-layer; and

a physical layer entity configured to implement an OSI reference model physical (PHY) layer protocol to transmit said data to a user device.

21. The apparatus of claim 20 further comprising a centralized medium access control (C-MAC) sub-layer entity.

22. The apparatus of claim 20 wherein said distributed protocol entity includes at least one of a distributed radio link protocol (RLP) entity and a distributed medium access control (D-MAC) sub-layer entity.

23. The apparatus of claim 20 further comprising a retransmitter configured to receive a sequence number of a next data byte to be transmitted to said user device, said sequence number comprising at least one of a first data byte of newly transmitted data and a first data byte of previously transmitted data.

24. A system for providing wireless data communication, said apparatus comprising:
a controller comprising a central protocol entity which comprises:

a buffer configured to receive data in accordance with an Open Systems Interconnection (OSI) reference model level 3 protocol;

a switch configured to select one of a centralized mode and a distributed mode;

an automatic repeat requestor configured to implement, when said centralized mode is selected, all operations of an OSI reference model layer 2 protocol to deliver said data to at least one transceiver device; and

a multi-caster configured to implement, when said distributed mode is selected, only a portion of operations of said layer 2 protocol to deliver said data to said at least one transceiver device;

said portion of operations of said layer 2 protocol including at that of a centralized protocol sub-layer;

said at least one transceiver device comprising:

a further buffer configured to receive said data in accordance with said selected one of said centralized mode and said distributed mode;

a distributed protocol entity configured to implement, when said distributed mode is selected, a further portion of said layer 2 protocol prior to transmitting said data, said further portion of said layer 2 protocol including at least one distributed protocol sub-layer; and

a physical layer entity configured to implement an OSI reference model physical (PHY) layer protocol to transmit said data to a user device;

said controller further comprising a control entity configured to control said central protocol entity and said distributed protocol entity.

25. The system of claim 24 wherein said multi-caster is further configured to deliver said data to a plurality of said transceiver devices such that only one of said plurality of transceiver devices transmits said data to a user device.

26. The system of claim 24 wherein said automatic repeat requestor is further configured to deliver said data to at least two of said transceiver devices such that both of said transceiver devices concurrently transmit said data to a user device.

27. An apparatus for providing wireless data communication, said apparatus comprising:
means for receiving data in accordance with an Open Systems Interconnection (OSI) reference model level 3 protocol;

means for selecting one of a centralized mode and a distributed mode;

means for implementing, when said centralized mode is selected, all operations of an OSI reference model layer 2 protocol to deliver said data to at least one transceiver device; and

means for implementing, when said distributed mode is selected, only a portion of operations of said layer 2 protocol to deliver said data to said at least one transceiver device;

said portion of operations of said layer 2 protocol including at that of a centralized protocol sub-layer.

28. An apparatus for providing wireless data communication, said apparatus comprising:

means for receiving data in accordance with a selected one of a centralized mode and a distributed mode; said means for receiving including means for receiving, in accordance with said centralized mode, said data subsequent to implementation of all of an Open Systems

Interconnection (OSI) reference model layer 2 protocol and including means for receiving, in accordance with said distributed mode, said data subsequent to implementation of a portion of said OSI reference model layer 2 protocol;

means for implementing, when said distributed mode is selected, a further portion of said layer 2 protocol prior to transmitting said data, said further portion of said layer 2 protocol including at least one distributed protocol sub-layer; and

means for implementing an OSI reference model physical (PHY) layer protocol to transmit said data to a user device.

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